

What is claimed is:

1 1. An apparatus for imaging the mouth of a user while
2 detecting the speech of the user comprising:
3 a headset adapted so as to be worn on the head of the
4 user;
5 a video camera mounted on the headset and positioned so
6 as to capture a frontal view of the mouth of a user;
7 a microphone mounted on the headset and positioned so
8 as to detect the speech of the user;
9 an illumination source mounted on the headset for
10 illuminating the mouth of the user;
11 a communication device transmitting the output of the
12 video camera and the output of the microphone to a computer.

1 2. The apparatus of claim 1 wherein the video camera is a
2 black and white CMOS type camera.

1 3. The apparatus of claim 1 wherein the video camera is a
2 color CMOS type camera.

1 4. The apparatus of claim 1 wherein the video camera is a
2 black and white CCD type camera.

1 5. The apparatus of claim 1 wherein the video camera is a
2 color CCD type camera.

1 6. The apparatus of claim 1 wherein the video camera is
2 positioned so as to capture a frontal view of the mouth of
3 the user and is positioned substantially on the center line
4 of the mouth.

1 7. The apparatus of claim 1 wherein the video camera
2 positioned so as to capture a frontal view of the mouth of
3 the user and is positioned to the side of the center line of
4 the mouth.

1 8. The apparatus of claim 1 further comprising an optical
2 filter limiting light entering the video camera to a band of
3 infrared wavelengths.

1 9. The apparatus of claim 1 wherein the microphone is of
2 the noise reduction type.

1 10. The apparatus of claim 1 wherein the illumination
2 source includes a plurality of broadband light emitters.

1 11. The apparatus of claim 10 further comprising an optical
2 filter limiting light emitted from said broadband light
3 emitters to a band of infrared wavelengths.

1 12. The apparatus of claim 1 wherein the illumination
2 source includes a plurality of narrowband light emitters.

1 13. The apparatus of claim 12 further comprising an optical
2 filter limiting light emitted from said narrowband light
3 emitters to a band of infrared wavelengths.

1 14. The apparatus of claim 1 wherein the illumination
2 source is continuously energized.

1 15. The apparatus of claim 1 wherein the illumination
2 source is periodically energized.

1 16. The apparatus of claim 15 wherein the illumination
2 source is de-energized during retrace or blanking periods of
3 the video camera.

1 17. The apparatus of claim 15 wherein the illumination
2 source is periodically energized by a pulse generator having
3 a pulsed output, wherein a period of the pulsed output and a
4 pulse width of the pulsed output are independently
5 controlled.

1 18. The apparatus of claim 1 wherein the headset includes a
2 boom supporting the video camera and illumination source so
3 as to capture the frontal view of the mouth.

1 19. The apparatus of claim 18 wherein the boom supports the
2 microphone to position the microphone in the vicinity of the
3 mouth.

1 20. The apparatus of claim 1 further comprising an
2 amplifier coupled to the microphone.

1 21. The apparatus of claim 1 wherein the communication
2 device includes a radio frequency transmitter receiving the
3 video output of the video camera and the audio output of the
4 microphone and a corresponding receiver adapted to provide
5 the video and audio to the computer.

1 22. The apparatus of claim 1 wherein the communication
2 device is cabling.

1 23. The apparatus of claim 1 further comprising a speaker
2 for transmitting sound to the user, the speaker positioned
3 in proximity to the ear of the user.

1 24. The apparatus of claim 23 further comprising a
2 communication path from the computer to the speaker.

1 25. The apparatus of claim 24 wherein the communication
2 device for communicating the output of the microphone to the
3 computer and communication path from the computer to the
4 speaker are used in combination to perform conventional
5 telephony wherein the computer communicates with
6 conventional telephony interfaces.

1 26. The apparatus of claim 25 wherein the computer is
2 adapted to perform telephony functions over the internet.

1 27. The apparatus of claim 1 further comprising:
2 a speaker for transmitting sound to the user, the
3 speaker positioned in proximity to the ear of the user;
4 a wireless telephony transceiver connected to the
5 speaker and the microphone to provide wireless telephony
6 functions.

1 28. The apparatus of claim 1 wherein the illumination
2 source is adjustable to shape a light output distribution to
3 reduce exposure of eyes of the user to the light output.

1 29. The apparatus of claim 1 further comprising a fiber
2 optic cable providing an optical image of the frontal view
3 of the mouth to the video camera.

1 30. The apparatus of claim 1 wherein the illumination
2 source includes a fiber optic cable to illuminate the mouth
3 of the user.

1 31. The apparatus of claim 1 further comprising a tube
2 acoustically coupled to the microphone so as to provide
3 speech of the user to the microphone.